

Launch Tennessee

SBIR/STTR OPPORTUNITIES

ABOUT LAUNCHTN

LaunchTN is a public-private partnership with a vision to make Tennessee the best state in the nation for startups, by empowering a network of resources that support Tennessee's entrepreneurial ecosystem.

TENNESSEE'S STARTUP ECOSYSTEM

COMPETITIVE ADVANTAGE

Tennessee is one of the few states with a **distributed entrepreneur network** operating at the state level.





PORTFOLIO OF RESOURCES

MICROGRANTS

Providing **financial support for grant-writing or technical expertise** to TN-based early-stage companies, specifically in the commercialization space

MENTOR NETWORKS

Pairing mentors and promising new companies and entrepreneurs through panel presentations and mentoring services

INNOVATION CAPITAL CONTINUUM

Providing in-demand **capital solutions for scalable early-stage companies**; promoting financial opportunity and inclusion for all citizens



COVID-19

TENNESSEE INNOVATION CROWDSOURCE PLATFORM

launchtn.org/innovationplatform

Working in partnership with **Tennessee's COVID-19 Unified Command** to engage companies, including entrepreneurs and startups, to **rapidly connect solutions**, **resources**, **and capabilities to major issues** facing our state.

UPDATES AND RESOURCES

launchtn.org/covid-19

Curated list of **guidance** from health officials, **updates** from our statewide network partners, **resources** to support small businesses and startups, webinars and other **virtual learning opportunities**, and other information as needed.





Driving Innovation With Your Small Business:

SBIR/STTR Funding

PRESENTED BY Jim Stefansic // Commercialization Consultant

MATERIAL PROVIDED IN PART BY Mark Henry // President Grow Emerging Companies, LLC FUNDING PROVIDED IN PART BY:



For personal use only - DO NOT DISTRIBUTE



Jim Stefansic Commercialization Consultant

- Co-founder of Pathfinder Therapeutics, Inc.
 - Medical device startup out of Vanderbilt University
 - Raised over \$14MM in venture capital as COO
 - Served as PI on over \$3.5MM in SBIR funding
 - Survived "Valley(s) of Death"
 - Funding used to complete device platform & for clinical trials
 - Company sold to Analogic after 10 years
- Also co-founded and served as CEO of Raiven Healthcare
- Education
 - PhD: Biomedical Engineering, Vanderbilt University
 - MBA: Belmont University
- Currently Director of Corporate Development, Cumberland
 Emerging Technologies





AGENDA

Overview of SBIR/STTR

- Program overview, eligibility rules & key differences
- Grants vs. contracts
- Major agency differences size & scope
- Finding solicitations for agencies

Overview of proposal components & writing strategy

- "5 Key Questions You Must Answer"
- Quad Chart
- Business Model Canvas

Timelines & logistics – coordination with statewide resources

YOU WILL LEAVE THIS SESSION WITH ...

- A thorough understanding of whether or not SBIR/STTR is a good opportunity for you/your firm
- Our **insider advice** that will save you time figuring it out yourself
- Tips to **increase your chances** of winning the award

- An understanding of this environment and the need for good ideas, good teams, and good writing
- A **detailed action plan** for preparing to write a Phase I SBIR/STTR Proposal



WHAT IS SBIR/STTR?

SBIR/STTR is the best opportunity for most small, high-tech firms to seek early-stage R&D funding.

"Small Business Innovation Development Act"

- Congress established SBIR program in 1982; STTR in 1992
- Renewed as part of S.2943, 2017 National Defense Authorization Act (NDAA) for 5 additional years (FY18 through FY22)

R&D money set aside for high-risk, high-payoff research conducted by small, for-profit firms.



WHAT IS SBIR/STTR?

Proof-of-concept Feasibility study	Phase IIb funding to get through one "Valley of Death"		
Phase I	Phase II	Phase III	
	Prototype development Field-testing Demonstrations Clinical investigations demonstrating safety and efficacy	Follow-on R&D and commercialization Venture funding Sales?!	



SBIR/STTR AS PART OF FUNDING STRATEGY



WHO QUALIFIES FOR SBIR/STTR?

SMALL BUSINESS

- 500 or fewer employees (including affiliates)
- For-profit
- Individual Ownership
 - Greater than 50% US-owned by individuals and independently operated OR
 - Greater than 50% owned and controlled by other business concern/s that is/are greater than 50% owned and controlled by one or more individuals OR
 - Be a concern which is more than 50% owned by multiple venture capital operating companies, hedge funds, private equity firms, or any combination of these

ALL WORK MUST BE PERFORMED IN UNITED STATES PATENT RIGHTS GO TO SMALL FIRM; GOVERNMENT HAS LIMITED RIGHT TO USE



SBIR/STTR CRITICAL DIFFERENCES

	SBIR	STTR	
PARTNERING REQUIREMENT	Permits Partnering	Requires a non-profit research institution partner	
PRINCIPAL INVESTIGATOR	Primary Employment must be with the small business	PI may be employed by research institution OR small business*	
WORK REQUIREMENT	GUIDELINES: may outsource up to 33% in Phase I, 50% in Phase II	REQUIRED: 40% small business; 30% research institution partner	
PROGRAM SIZE	3.2% (FY18- \$3B)	.45% (FY18 - \$380M)	
AGENCY PARTICIPATION	11 agencies (extramural R&D budget > \$100M)	5 agencies (extramural R&D budget > \$1B)	

*EXCEPT NSF – PI must be primarily employed by small business

OTHER SBIR/STTR DIFFERENCES

- Solicitation differences among (and within) agencies
- Budget differences (agency size/level of funding)
- Grant agencies vs. contract agencies
- Various amounts awarded over different times
- Different pre-review/sorting processes and objectives
- Different review processes
- Various levels of interest in commercial potential
- Wide diversity in the topics and areas of interest as well as the projects funded

Recent Changes

Reathorization (2013-2018)

Venture Capital (VC) funded companies are eligible for SBIR but cannot be >50% owned by a single VC fund and awards are capped

Direct to Phase II Program REAUTHORIZED AGAIN only for NIH / DoD / DoE

For any studies involving human subjects, review new rules and regulations on what defines a clinical trial



YOU MAY CHOOSE SBIR IF:

- You do not plan to include a nonprofit research entity as a subcontractor
- You do not plan to use the nonprofit research entity for more than 33% of the work/research effort in Phase I
- Potential investors don't like the idea of involving a nonprofit research institution
- The research institution would rather act as an independent consultant
- The topic(s) best aligned with your work only exist under SBIR

YOU MAY CHOOSE STTR IF:

- Your plan requires a large subcontract of the award
- The small business and nonprofit research entity are equal partners
- You believe your likelihood of success depends on it
- The topic(s) best aligned with your work only exist under STTR



GRANTS VS. CONTRACTS

CONTRACT AGENCIES (~60%):

- Typically have **narrow topics**
- Have a **specific problem or need** → you must grasp and respond to that need
- Proposals are reviewed internally
- Purpose is to directly benefit the government in fulfilling public duties
- Deliverables are provided to **government** agencies

GRANT AGENCIES (~40%):

- Want to support good ideas; must determine what they think is "good"
- Typically very broad topics → can propose your idea
- Proposals are **reviewed by a third party**
- Meant to advance public purpose
- Deliverables are meant for **public use**

"Focus on what we asked for, not what you think we need." -Susan Nichols, DARPA SBIR Program Manager



SBIR VS. STTR

Department of Agriculture (USDA)	Department of Homeland Security (DHS)	Department of Energy (DOE)
Department of Commerce (DOC) NIST, NOAA	Department of Education (DoED)	Environmental Protection Agency (EPA)
Department of Transportation (DOT)	Department of Defense (DOD)	National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)	Department of Health and Human Services	SBIR ONLY SBIR + STTR



GRANTS VS. CONTRACTS

Department of Agriculture (USDA)	Department of Homeland Security (DHS)	Department of Energy (DOE)
Department of Commerce (DOC) NIST, NOAA	Department of Education (DoED)	Environmental Protection Agency (EPA)
Department of Transportation (DOT)	Department of Defense (DOD)	National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)	Department of Health and Human Services (HHS)	Grants Contracts Grants and Contracts



Agencies with SBIR & SBIR Programs	Approx Budget
Department of Defense (DOD)	\$1.750B
Department of Health and Human Services (DHHS), including the National Institutes of Health (NOH)*	\$1.088B
Department of Energy (DOE), including Advanced Research Projects Agency – Energy (ARPA-E)	\$280.0M
National Science Foundation (NSF)	\$202.4M
National Aeronautics and Space Administration (NASA)	\$198.0M
Agencies with only SBIR Programs	
Department of Agriculture (USDA)	\$27.0M
Department of Homeland Security (DHS): Science and Technology Directorate (S&T) & Countering Weapons of Mass Destruction Office (CWMD)	\$20.8M
Department of Commerce: National Oceanic and Atmospheric Administration (NOAA) & National institute of Standards and Technology (NIST)	\$14.2M
Department of Transportation (DOT)	\$8.5M
Department of Education (ED)	\$7.5M
Environmental Protection Agency (EPA)	\$4.2M

AGENCIES AND SBIR/STTR BUDGET SIZES



DHHS (NIH) SBIR/STTR GRANT PROGRAM

NATIONAL INSTITUTES OF HEALTH



**

NIH OVERVIEW

HHS and NIH are made up of distinct units, but there are many similarities, like siblings

- Fund grants AND contracts*
- Read the Funding Opportunity Announcements (FOA) RFAs and PARs
- Scientific peer review is critical
- You can and should contact them **early**!

QUESTIONS ABOUT WHO TO CONTACT? EMAIL SBIR@OD.NIH.GOV



OMNIBUS VS. TARGETED FOA GRANTS

OMNIBUS SOLICITATIONS

- Include Phase I, Phase II, Fast-Track, and Direct to Phase II
- These are **investigator initiated** and can be on any topic, although there are topics of interest by each institute <u>see this link.</u>

TARGETED FOA SOLICITATIONS

- Release dates, topics, phases and receipt dates vary
- <u>Check the NIH Guide published</u>
 <u>weekly</u>
- Check your relevant institute website
- Sign up for your relevant institute listserv <u>like this example.</u>



NIH THREE PHASE PROGRAM





NSF SBIR/STTR GRANT PROGRAM

NSF PROCESS

- See what they fund
- Determine your eligibility
- Preview the Project Pitch (optional)
- SUBMIT YOUR PROJECT PITCH (REQUIRED)
- Register your company (FREE and required)
- Read the call for proposals (solicitation)
- Submit your full proposal (if invited)



NSF FUNDING FOCUS

PROPOSALS IN ALL AREAS OF ENGINEERING AND SCIENCE AND RELATED EDUCATION ARE WELCOME

- Advanced Manufacturing and Nanotechnology (MN)
- Advanced Materials and Instrumentation (MI)
- Biological Technologies (BT)
- Biomedical Technologies (BM)
- Chemical and Environmental Technologies (CT)
- Digital Health (DH) and Medical Devices (MD)
- Educational Technologies and Applications (EA)
- Electronic Hardware, Robotics and Wireless Technologies (EW)
- Information Technologies (IT)
- Internet of Things (I), Semiconductors (S), and Photonic (PH) Devices and Materials
- Other Topics (OT)



NSF FIRST REQUIRED STEP – PROJECT PITCH

The required Project Pitch allows startups and small businesses to get quick feedback at the start of their application for Phase I funding from America's Seed Fund powered by NSF.

IF YOU ARE CONSIDERED A "GOOD FIT" YOU WILL BE INVITED TO SUBMIT A FULL PHASE I PROPOSAL.

https://nsfgov.secure.force.com/sbir/



NSF FIRST REQUIRED STEP – PROJECT PITCH

#1 THE TECHNOLOGY INNOVATION

(UP TO 500 WORDS)

Describe the technical innovation that would be the focus of a Phase I project, including a brief discussion of the origins of the innovation as well as explanation as to why it meets the programs mandate to focus on supporting research and development (R&D) of unproven, high-impact innovations.

#2 TECHNICAL OBJECTIVES AND CHALLENGES (UP TO 500 WORDS)

Describe the R&D or technical work to be done in a Phase I project, including a discussion of how and why the proposed work will help prove that the product or service is technically feasible and/or significantly reduce technical risk. Discuss how, ultimately, the work could contribute to making the new product, service, or process commercially viable and impactful.

#3 THE MARKET OPPORTUNITY

(UP TO 250 WORDS)

Describe the customer profile and pain points(s) that will be the near-term commercial focus related to this technical project.

#4 THE COMPANY AND TEAM (UP TO 250 WORDS)

Describe the background and current status of the applicant small business, including key team members who will lead the technical and/or commercial efforts discussed in this Project Pitch.



NSF FIRST REQUIRED STEP – PROJECT PITCH

GOOD FIT

You'll be invited to submit a full proposal.

The program director will be able to provide guidance, feedback and support through the required registration and proposal submission process.

NOT A GOOD FIT

Immediate feedback.

You'll be told why NSR wouldn't fund your project. You'll have to go back to the drawing board. You can submit another pitch (up to 2 pitches total) in a submission window.

INCOMPLETE PITCH?

NSF WILL ASK FOR MORE INFORMATION!

The program director will reach out via email or phone to learn more.





SUBMISSION WINDOWS

Allow a company to submit a full proposal at any time (after invite):

THROUGH MARCH 5th

MARCH 6th - JUNE 4th

JUNE 5th - SEPTEMBER 3rd

SEPTEMBER 4th – DECEMBER 3rd

All invited companies will be in contact with the Program Director about the full proposal review timeline.



NSF DIRECT FEEDBACK ON PROJECT PITCH

HENRY AHN, PROGRAM OFFICER BIOMEDICAL (BM) TECHNOLOGIES AND MEDICAL DEVICES (MD)

"At minimum, there should be **enough evidence that the technology that you are trying to develop works** as you intend to use it. Significant competitive advantage. Anytime you can quantitate, that would be great."

"Evidence of **demand for your technology** would help. We allow up to 3 letters of support for a Phase I application. Including some very strong support letters from your potential customers, investors and/or potential partners will help strengthen your application."

"Ultimately, we want to be able to help companies to advance the technology enough to be able to continue to grow. If companies outline (or prioritize) the milestones based on where they have to be to continue to grow (e.g. investors or strategic partners consider them important prior to engaging in additional discussion), those tend to be better milestones. Even if our reviewers do not think a certain milestone is important, if that's going to get you in front of a large strategic partner or an investment commitment, reviewers cannot argue with the importance of the milestone."



NSF SOLICITATION / CALL FOR PROPOSALS

READ THE SOLICITATION!

It's everything you need to know, from eligibility information to proposal preparation and submission guides.

Find it on NSF website at: https://seedfund.nsf.gov/apply

Small Business Innovation Research Program Phase I (SBIR)

PROGRAM SOLICITATION NSF 20-527

REPLACES DOCUMENT(S): NSF 19-554



National Science Foundation

Directorate for Engineering Industrial Innovation and Partnerships

Submission Window Date(s) (due by 5 p.m. submitter's local time):

December 18, 2019 - March 05, 2020

March 06, 2020 - June 04, 2020

June 05, 2020 - September 03, 2020

September 04, 2020 - December 03, 2020

Small businesses can submit a Project Pitch at any time. Small businesses that have been invited to submit a full proposal can submit a proposal based on that Project Pitch at any time during one of the submission windows listed above.



DOE SBIR/STTR GRANT PROGRAM

WHAT DOES DEPARTMENT OF ENERGY FUND?

DOE's Mission is to ensure America's security and prosperity by addressing its **energy**, **environmental**, and **nuclear** challenges through transformative science and technology solutions.

- **Goal 1:** Catalyze the timely, material, and efficient transformation of the nation's energy system and secure U.S. leadership in energy technologies.
- Goal 2: Maintain a vibrant U.S. effort in science and engineering as a cornerstone of our economic prosperity, with clear leadership in strategic areas.
- Goal 3: Enhance nuclear security through defense, nonproliferation, and environmental efforts.

https://science.energy.gov/sbir/research-areas-and-impact/


DOE SBIR OPERATION

Phase I GRANTS

- Issue **two** Funding Opportunity Announcements annually
- Typically very focused topics areas, approximately 70 topics per year
- Awards up to \$200,000, 6-12 months duration
- **REQUIRES COMMERCIALIZATION PLAN**

Phase II GRANTS

- Phase I awardees compete Phase II Awards the following year
- Awards up to \$1,100,000 or \$1,600,000 (varies by topic) and 2 years duration
- Also have 2 additional Phase II mechanisms

Schedule: https://science.energy.gov/sbir/funding-opportunities/



DOE SBIR OPERATION

Online learning system to assist new applicants <u>https://science.osti.gov/SBIRLearning</u>

First time applicants can utilize Phase 0 Application Assistance Program www.dawnbreaker.com/doephase0

Letter of Intent (LOI) writing assistance (REQUIRED BEFORE SUBMISSION)

- Phase I Proposal Preparation, Review and Registration Assistance
- Market Research Assistance
- Small Business Development Training, Mentoring and Registrations
- Technology Advice and Consultation
- Intellectual Property Consultation
- Indirect Rates and Financials



PARTNERSHIP WITH DOE NATIONAL LABS

• Specific Technology Transfer Opportunities (TTOs) with National Labs available for some topics

- If at all possible accept standard agreement terms with the lab
 - Deviations require DOE approval
- When including a DOE lab on an SBIR proposal, DOE must approve the lab portion of the statement of work
 - Please provide adequate time (~60 days) for the review/approval process

https://science.energy.gov/sbir/applicant-resources/national-lab s-profiles-and-contacts/

https://www.labpartnering.org/partnering

https://smallbusiness.ornl.gov/





DOD & NASA SBIR/STTR CONTRACTS PROGRAM

DOD SBIR/STTR OVERVIEW





PARTICIPATING DEFENSE AGENCIES



Army



Missile Defense Agency



Navy



Defense Advanced Research Projects Agency



Air Force

Defense Health Program



Joint S&T Office for Chemical and Biological Defense



Defense Logistics Agency





Defense Microelectronics Activity

Command

Special Operations



×9.

Defense Threat Reduction Agency



National Geospatial Intelligence Agency



SUBMITTING A CONTRACT PROPOSAL TO DOD

Each year, the services and defense agencies within the DoD issue three SBIR solicitations and three STTR solicitations.

Not all agencies solicit proposals in each announcement. https://sbir.defensebusiness.org

SUBMISSION PROCESS

- Determine Eligibility
- Find a Topic
- Ask Questions During Pre-Release Period
- Prepare Proposal
- Submit Proposal



AIR FORCE INNOVATION

1. Apply for Phase I SBIR contract (15-slide pitch deck and 5-page online application).

2. If accepted:

- Use \$50K Phase I to locate Air Force customer and get memorandum of agreement
- Browse focus areas and Air Force user needs for point of contact
- Attend AFWERX events, and/or reach out to support@afwerx.af.mil

3. If you find a match between your product and Air Force end-user, **apply for up to \$3M in Phase II** for trial period of solution.

4. Progress to sole-source contract with any U.S. Federal Government Agency. After trial, **you are given the right to sole-source (i.e., no-tender competition) contract with any agency.**



SBIR Open Topics to increase the efficiency, effectiveness, and transition rate of the SBIR program

https://www.afwerx.af.mil/sbir.html



AFWERX EXPANSION: OPEN TOPICS AT DOD

The Army is seeking to develop **deployable**, **portable platforms that can be scaled to provide enough power for large scale operations** ranging from life support for a tactical operations center, humanitarian assistance after natural disasters, and rapid charging of electric vehicles to the recharging of batteries that power electronic soldier systems at a small unit level.

The Navy open topic is seeking innovative approaches to understand and improve the well-being of sailors, marines, civilians, and their families.

The NGA open topic is focused on **data analytics and visualization**, **computer vision and machine learning**, **earth modeling**, **and business intelligence and data-driven production**.









NASA SBIR/STTR OPERATION



http://www.sbir.nasa.gov/guide



NASA CONTRACT FOCUS AREAS

NASA's research subtopics are organized by "Focus Areas" that group interests and related technologies.

- Identify the Area(s) closest to your innovation/idea
- Go to their website to research
- **Prepare to write** a proposal tailored to NASA's needs

2018-2019 Focus Areas

- 1. In-Space Propulsion 12. Er Technologies La
- 2. Power and Energy Storage
- 3. Autonomous Systems for Space Exploration
- 4. Robotic Systems for Space Exploration
- 5. Communications and Navigation
- 6. Life Support and Habitation Systems
- 7. Human Research and Health Maintenance
- 8. In-Situ Resource Utilization 19.
- 9. Sensors, Detectors and Instruments
- 10. Advanced Telescope Technologies
- 11. Spacecraft and Platform Systems

- . Entry, Descent and Landing Systems
- 13. Information Technologies for Science Data
- 14. In-Space and Advanced Manufacturing
- 15. Lightweight Materials, Structures, Assembly, and Construction
- 16. Ground and Launch Processing
- 17. Thermal Management Systems
- 18. Air Vehicle Technology
 - Integrated Flight Systems
- 20. Airspace Operations and Safety
- 21. Small Spacecraft Technologies
- 22. ISS Utilization and Microgravity Research



REGISTRATION PROCESS

SBIR/STTR INITIAL REGISTRATION

Standard Registration items for all agencies

- **EIN** Employer Identification Number
- **DUNS number*** 9-digit code for each physical location of business
- System for Award Management (SAM) federal procurement system
- SBA's Company Registry Database SBC control id

DoD does not require SAM registration until time of award but encourage applicants to get it when submitting.

SAM registration is not required before the SBIR.gov registration.

*GSA recently announced that DUNS will be replaced by a new Government-owned unique entity identifier in all systems, including Grants.gov and eRA Commons and incorporated into the SAM registration process – UEI or SAMMI number

Checklist for requirements - Appendix B

NOTE for NIH Applications

NO MORE ADOBE FORMS. USE ASSIST!

Downloadable form option retired Jan. 1, 2018

Grants.gov no longer provides an option to download application package

Grants.gov no longer processes application packages previously downloaded



SBIR/STTR REGISTRATION REQUIREMENTS

	NASA	HHS	NSF	DOE	DOD
DUNS NUMBER	x	X	X	X	X
SAM.GOV	x	x	x	x	x
SBIR.GOV [COMPANY REGISTRY]	x	X	X	X	X
GRANTS.GOV		x	x	x	
ERA COMMONS		x			
ELECTRONIC HANDBOOK (EHB)	x				
NSF FASTLANE			X		
DOE PORTFOLIO ANALYSIS AND MANAGEMENT SYSTEM (PAMS)				X	
FEDCONNECT.NET (FEDERAL GOVERNMENT ACQUISITION AND GRANT PORTAL)				x	
FUNDING ACCOUNTABILITY AND TRANSPARENCY ACT SUB-AWARD REPORTING SYSTEM				x	
DOD SUBMISSION WEBSITE (DODSBIR.GOV)					x



OVERVIEW OF PROPOSAL CONTENT

PROPOSAL PROBLEMS

IF WE HAD A NICKEL FOR EVERY TIME WE SAW THESE COMMON PROPOSAL WEAKNESSES...

- Lack of clarity, consistency
- Lack of technical detail
 - Especially vague research/work plans
- No evidence of innovation or uniqueness
- No statement of the feasibility question, risk, or solution measure
- Much too much background stuff
- Fail to present a credible commercialization story
- Lack of a commercialization strategy
- Lack of credible PI &/or team
- Lack of credible/defensible/sensible cost proposal
- Lack of attention to detail (margins, font, page count, etc.)



TYPICAL PROPOSAL CONTENT

- Cover letter
- Abstract/summary and potential benefits
- Identification of problem / opportunity (including assessing state of the art)
- Technical objectives
- Research plan
- Related work
- Relationship to future research or R&D

- Commercialization strategy
- PI, key personnel, subcontractors, consultants
- Facilities, resources, and equipment
- Prior, current, or pending awards
- Cost proposal and budget justification
- Letters
- Subcontractor (e.g., STTR) agreements



5 QUESTIONS YOU MUST ANSWER



Will your team make the major **commitment** necessary to win?



Do you have a great research or R&D idea?



Does the government funding timeline make sense for your R&D needs and for your needs?



Can your team prove its **credibility** in this highly competitive arena?



Do the Phase I and Phase II **budgets** and **scopes of work** make sense for your R&D needs?

*1 LEVEL OF COMMITMENT

Developing a competitive proposal can take hundreds of hours. A Phase I SBIR typically requires between 100 and 300 person-hours.

- Are you willing and able to commit the required hours and funds to develop the proposal?
- Do you have a champion for this proposal project?
- Is the rest of your team willing to do what is necessary? Do they understand what they need to do, and when? Can you count on them to perform?



Your proposal champion must be willing to do anything to win!





What is the "great" idea? Is it really research? Is it really new and potentially valuable?

Is the idea genuinely novel? Can you prove it? Do you know the state of the art?

Does the concept have a market? What is it? How do you know? How long will it last?

Who in the federal government would care? How do you know? Are you an inventor or an entrepreneur? Is the idea just an invention or the basis for a successful business?

Is the idea consistent with your business plan/model?

Does it meet the stated criteria in the SBIR/STTR solicitation?

What kind of competition do you have?

(If you really believe you have no competition, go directly to jail, do not pass "Go," and do not collect \$200....)



Just because you have a patent doesn't make something valuable.

"User-operated amusement apparatus for kicking the user's buttocks"

Joe W. Armstrong (Lenoir City, TN) US 6,293,874 (Sep. 25, 2001)



#2 VIABILITY ARE YOU READY TO START THE AWARD PROCESS?

For R&D Projects

- Has work begun ("preliminary data")?
 What R&D remains?
 Do key feasibility issues remain?
- Is the idea already patented and is that a good thing or a bad thing?
- Why does the idea still need seed money, and why do the Feds need to provide it?
- How will you sell the idea as an R&D project? Will it STILL be an R&D project when it is funded?

For Development Projects

 Is the current stage of development ideal for the solicitation's intent? Is the "Technology Readiness Level" (TRL) appropriate (if applicable)?





SBIR & STTR TECHNOLOGY READINESS LEVELS



#3 TIMELINE AND PLANNING

Have you mapped out a realistic development and commercialization timeline for your product/service?

How does that timeline align with the typical government funding cycle?

What IS the typical funding cycle for the process you are pursuing?

The government process is slow and imperfect, but what are your real alternatives?? The SBIR/STTR Phase I/Phase II completion timeline is 3-5 years (best case).

Can your company survive

during this time?

Will the marketplace for the idea survive this timeline?

Who is the competition?

How are they funded? Where will they be after 3 to 5 years?



APPENDIX C: RESOURCES FOR SUCCESS/ADDON PROGRAMS



#4 ESTABLISH CREDIBILITY

WHO IS YOUR PRINCIPAL INVESTIGATOR (PI)?

- Is the PI an expert in the application area?
- Does the PI have appropriate academic, industrial, and other credentials?
 Publications? Project-management experience?
- Is the PI eligible/available for the particular program?

(For SBIR, it's 51% employed by the small firm during the project. Check each agency solicitation for the specific basis being used and for PI minimum commitments to the projects.) Is the right team in place? Collaborators? Are the state of the art and other key players known?

Does the company (or do the team members) have a proven track record of commercializing technology-based products? SHOW, don't just tell.

Are the necessary facilities/equipment available? Do you have proof?

Has related work been completed? Does compelling preliminary data exist (produced by you and/or others)?



#5 BUDGET ALIGNMENT

- **Review RFP** thoroughly before writing
- When you start writing also start your budget because your budget needs to match your scope of work
- Follow the rules
- Make sure you have a balance of direct, indirect, and fee that allows you to run your business
- Provide a complete budget narrative and justification
- Make sure you understand the difference between direct costs, indirect costs and fee

Make sure the direct costs component of your budget is consistent with the work proposed.

No one will be impressed if you try and complete 2x the work for the budget proposed. They will instead assume you don't understand the costs associated with the work and that you can't properly manage the project.



BULLET POINT PROCESS

"BULLET POINT" PROCESS



"Getting Ready to Write" Mark Henry // President Grow Emerging Companies, LLC



Mark Henry has three decades of federal funding experience and developed/managed the proposal process at Bend Research, Inc.

He won 175 of 350 SBIR proposals at Bend



"BULLET POINT" PROCESS

Identify and articulate a significant unmet need (or unfulfilled opportunity) with high potential IMPACT — including what is wrong with the current state of the art.

Describe your novel approach to solving the problem or pursuing the opportunity (based on compelling preliminary data), **including team qualifications** and the key technical/economic feasibility issues and the research questions and success metrics.

Describe how Phase I sets up a follow-on Phase II project and leads into Phase III commercialization, **including the major potential national impact.**



NINE BULLET POINTS – NUMBERS ONE THROUGH FOUR

Set the stage.

Identify and quantify the problem or opportunity.

AND SET UP YOUR INNOVATION.

- **Get the audience interested** at the outset (highlight the agency/national problem or opportunity).
- Identify and substantiate the importance of the problem
 the need (If the reviewers don't buy into the need or significance, the proposal is dead.)
- Summarize the **state of the art and its shortcomings** (without shortcomings, there's no need for R&D...)
- Discuss why the problem has not yet been solved, given that it's so important. **Describe the technical challenges** to solving the problem and the potential benefits (the TECHNICAL challenges are what the R&D is about).



NINE BULLET POINTS – NUMBERS FIVE AND SIX

State the theme and your solution.

- Describe the concept of your solution, **identify the innovation being pursued**, and establish the credibility of your team — including PRELIMINARY DATA. Discuss potential advantages in terms of addressing the disadvantages you identified in Setting the Theme.
- Present what you will attempt to prove in Phase I (and indicate how you will know when you are successful i.e., present measurable goals); list the key technical/economic questions that have to be answered in Phase I.



NINE BULLET POINTS – NUMBERS SEVEN THROUGH NINE

Create a vision.

- Discuss how Phase I success will set up Phase prototype/demonstration/validation.
- Discuss the overall plan for Phase II. What will the Phase II work involve? What will a prototype look like? How will you test the prototype? How will you get to the point in Phase II where the private sector will be convinced to step in and support Phase III?
- Envision the world with your solution in it ("Phase III"), including how you will finance Phase III.



NINE BULLET POINTS – MAKING THE STORY INTERESTING ... AND FUNDABLE

- **Capture the reviewer's attention immediately.** Use information from the "Bullet Point" exercise for the opening paragraphs.
- Single graphic **a single image** that tells the proposal story.
- Task list and schedule. Specific Aims or Objectives have Tasks – then Tasks have Milestones or Goals. Descriptive titles for each task; time required for each (Gantt Chart).
- **Staffing plan.** Names for each participant and % effort for each participant.
- Initial budget. Direct labor; other direct costs; indirect costs; profit or fee.



"If they can draw a picture of the concept, I'll tend to believe it."

-NIH reviewer

NINE BULLET POINTS - SINGLE GRAPHIC

Do one or more of your own to depict your concept.





NINE BULLET POINTS - GANTT CHART

Task Number and Description	1	2	3	4	5	6
1) Design a widget and perform experiments to assess widget						
2) Evaluate the widget and iterate						
3) Design commercial prototype of widget						
4) Evaluate commercial widget through investigations						
5) Prelim tech/econ evaluation & report results						



NINE BULLET POINTS - STAFFING PLAN

- Need to find the right balance of people and % effort needed for each task over the grant time period.
- Specific people should be named as often as possible – although reviewers understand small businesses may be hiring as grant funding received. Make sure you can demonstrate you can support the staff on either a full time or part time basis as warranted
- REMEMBER: PI <u>MUST be primarily</u> <u>employed by company for SBIR</u>. Others can be part-time.

- Having someone with project management experience is critical to the process – not necessarily formally trained but demonstration in the biographical sketch. Also someone with small business experience is critical – taking an idea from bench to market ideal.
- Reviewers will look for gaps or lack of experience, so make sure this is overcome in the biographical sketches – especially when staff can include personal statements or career highlights in their own words


NINE BULLET POINTS - BUDGET TIPS

- Take as close to **7% fee** as possible
- Ask for consultant Letters of Collaboration and quotes way ahead of time
- If using a subaward, start work way ahead of time – can take a long time for university turn-around
- Use the maximum safe rate for indirect cost (e.g. 40-50%) if possible

- Use the budget template to develop your budget! Search for & use a budget justification template. Helpful links:
 - <u>https://grants.nih.gov/grants/Electroni</u> <u>cReceipt/files/Annotated Forms Small</u> <u>Bus FORMS-E.pdf</u>
 - <u>https://seedfund.nsf.gov/fastlane/</u>
- Triple check your equations
- When in doubt, get your accountant to help



NINE BULLET POINTS - PROJECT SCOPE EXAMPLE

START WITH AWARD AMOUNT	\$225,000
Subtract fee (7% of total direct and indirect, NOT of award)	-\$14,700
Assume \$22.5K for PI salary (approx 25% effort over 12 months)	-\$22,500
Subtract \$50K for estimated indirect	-\$50,000
If NSF: Assume \$2,000 for travel to awardee conference, \$10,000 for boot camp, and \$5,000 for audit	NSF: -\$17,000
This remainder is a good budget starting point for materials, other senior personnel, more PL salary, and subcontracts	NSF: \$120,800
	NIH: \$137,800



CURRENT/FUTURE OPPORTUNITIES

AGENCY	OPENS	CLOSES	
Department of Agriculture	23 Jul. 2020	25 Oct. 2020	
Department of Commerce			
1. NIST	16 Jan. 2020	16 Mar. 2020	
2. NOAA	13 Nov. 2019	13 Feb, 2020	
Department of Defense: (solicitations typically	posted at least 30 days prior to ope	ning)	
URGENT: All components except Air Fo	rce extended due dates to 2	6 Feburary 2020.	
1. DoD 20.1	8 Jan. 2020	12 Feb. 2020	
2. DoD 20.2	31 May 2020	1 Jul. 2020	
3. DoD 20.3	24 Sep. 2020	24 Oct. 2020	
Department of Education:			
1. contracts	7 Dec 2019	21 Jan. 2020	
2. grants	15 Jan. 2020	3 Mar. 2020	
Department of Energy	12 Aug. 2020	15 Oct. 2020 24 Feb. 2020	
Dent of Health & Human Services (NIH C	DC EDA):	24100.2020	
1. PHS/NIH (grants)	15 May 2019	5 Apr. 2020	
1	the contraction of the and an area to be and the second	5 Sep. 2020	
		6 Jan. 2020	
2. PHS/NIH (contracts)	14 Aug. 2020	22 Oct. 2020	
Homeland Security 2020.1	18 Dec. 2019	22 Jan. 2020	
Department of Transportation 2016-1	17 Jan. 2020	20 Mar. 2020	
Environmental Protection Agency	13 Jun. 2020	31 Jul. 2020	
NASA	11 Jan. 2020	29 Mar. 2020	NOTE NSF NEW
NSF 2020.1	14 Jun. 2019	12 Dec. 2019	PROJECT PITCH PILO
2020.2	4 Mar. 2020	13 Jun. 2020	
NOTE: Housing & Urban Developm	ent has expressed interest, but curre	ntly has no SBIR program.	



Meeting with Program Managers:

The Quad Chart

PRESENTED BY Jim Stefansic // Commercialization Consultant



For personal use only - DO NOT DISTRIBUTE

WHAT IS A QUAD CHART AND WHY DO I NEED IT?

- For SBIR purposes, a Quad Chart is a tool SBIR program managers use in their initial evaluation of an application
- "Quad" refers to the 4 parts of the chart
- The chart is a concise way to share information about your project and team
- One is required in order to register for one-on-one sessions with any agency program managers
- A high-quality quad chart will make a good impression on agency program managers from potential funding agencies



THE QUAD CHART

LOGO HERE Contact: E-mail: COMPANY NAME (IF APPLICABLE) Location: AND OTHER DETAILS HERE Website:

Technology Description & IP Position

- . What is the product or service to be developed? What critical market will it address?
- How is it different and better than what already exists or is in the process of being researched and developed through federal funding?
- What stage is the product/service at in the R&D process? Is the technology still preprototype?
- How would your research team use \$150,000 and a six-month project performance period to prove early-stage success of your research idea?
- Have you considered what form of intellectual property protection would be most appropriate for protecting your technology once it is commercial-ready and on the market? Forms of IP protection include patents, trade secrets, and copyrights
- Have you conducted a preliminary patent search on USPTO.gov? Have you also run a keyword search for SBIR/STTR awards (which are pre-patent)?
- At what time during the course of your SBIR/STTR project do you plan to take action steps to protect your IP before it hits commercial market? Only a small portion of SBIR/STTR funding can be used to support legal/other services not permitted with the majority of these award

Technology Development Milestones

- What quantifiable measures of success will your team accomplish in the Phase I project to prove early-stage project feasibility?
- What kinds of product testing will need to be completed after Phase I to prove that your product is ready for commercial market?
- How will you work with customers throughout the project development process to obtain feedback on your technology that addresses specific needs?

Need / Market Opportunity & Impact

- What kinds of conversations have you had with potential customers to learn about their needs that could potentially be addressed by your technology?
- What indications of support have you received from potential customers (such as conditional order letters, letters of interest as project partners/customers)?
- What kind of online market research have you done to explore the competition compared features/limitations of those technologies with your proposed technology?
- ased on your online research and direct communication with potential customers, how big is the problem?
- What is it currently costing them (in terms of time, cost, quality of life for end users) to address the problem?
- How much would your customer pay for your technology (per unit), conditional upon developing a market-ready product by the end of Phase II?
- What is the size of the potential customer market that you plan to dominate with your technology?
- Within the broad market space, who comprises your initial target market?
- Have you identified existing industry players who could license your product after Phase II?
- How will your commercial-ready technology measurably improve the lives of end users?

Company/ Team & Business Model

- What key personnel roles do you currently have filled on your team?
- What kinds of project partners do you need to engage to gain access to specialized individual knowledge, facilities, and other resources?
- What are the market research areas that you plan to target with agency-specific projects?
- How does your project idea align with the mission and aims of your target funding agency?
- Which marketsegment will be most feasible for your team to address initially? Long-term?
- How do you plan to sell to customers after Phase II? Directly or via a licensing partner?

Biz Model Canvas





I-CORPs Programs & Business Model Canvas

PRESENTED BY Jim Stefansic // Commercialization Consultant



For personal use only - DO NOT DISTRIBUTE





WHAT IS I-CORPS?

- Leverages <u>NSF investments</u> in research lineage of previous support
- Small grants to focus on **creating a commercialization roadmap**
- Addresses the "Ditch of Death"
- Nimble funding immediate assessment
- **Projects are team-based** commercialization is team effort
- Process-oriented, curriculum-focused



I-CORP at NIH (PA-19-029) [Oct 2019]

An intensive Entrepreneurial Immersion course for scientists

Program was originally designed by serial entrepreneur Steve Blank in partnership with the NSF.

Over 600 academic teams have been through the program at NSF over the past 5 years.

NIH has worked closely with Blank and NSF to modify the program for life science startups.

Important goal of I-CORPs at NIH is to inform the Commercialization Plan.



WHAT IS I-CORPS?

WE FUND

- Novel, disruptive, game-changing technologies for a commercial product, process, or service
- High-risk, high-impact, high-payback
- Enabling technologies, especially with broad societal benefits

WE DON'T FUND

- Basic research
- Incremental (evolutionary optimization of existing products and processes, or straightforward modifications to broaden the scope of an existing product or process
- Business development, including market research



WHAT IS I-CORPS?





PLANS VS. PLANNING

"In preparing for battle I have always found that plans are useless, **but planning is indispensable.**"

Dwight Eisenhower



BUSINESS MODEL CANVAS

Business Model Generation (Osterwalder & Pigneur)

Value Proposition (VP)
 Customer Segments (CS)
 Channels (CH)
 Customer Relationships (CS)
 Key Activities (KA)
 Key Resources (KR)
 Key Partnerships (KP)
 Cost Structure (C\$)
 Revenue Streams (R\$)

strategyzer.com



(i) (ii) (iii) (iiii) (iii) (iii)

NOW FOCUS ON THE VALUE TO THE CUSTOMER

PRODUCT MARKET FIT

The Business Model Canvas		Designed for:		Designed by:	Date:	Version:
Key Partners Key Activities Who are our key partners? What Key Activities do our Value Propositions require? Key Resources Key Resources What key resources (supplies, etc) do our Value Propositions require?		Value Proposit Which o custome problem helping Or which needs a satisfying What is t product, What are features the cust needs?	ne of our ers is are we to solve? h customer re g? the specific /service? e the that match omer	Customer Relationships How will we get, keep and grow customers? Channels Through which channels do our customer segments want to be reached?	Customer Segmen For who are solving a pro or fulfilling a Who are the customers? Does the val match their n Is this a single-sided multi-sided market?	we oblem need? ue needs? or
Cost Structure What a in our b	re the most important co usiness model?	Revenue Streams What is the revenue model? What are the pricing tactics? For what value are our customers willing to pay?				

 Image: The sense bound on the cases of contrast on the cases of contrast on the case of contrast on the

Strategyzer
strategyzer.com

Focus on the Value Proposition and the Customer Segments for your application.



VALUE PROPOSITION

IS THERE A COMPELLING NEED?

- Do you solve a problem?
- Do customers understand the problem?
- Do customers even care!?

A simple statement to help define the value proposition:

"X is a _____ [describe] company.

Through its _____ [feature(s)], it provides _____ [unique benefit(s)] to [target market]."



Most academic spinouts fail because they develop something no one cares about.



CUSTOMER SEGMENTS

CUSTOMER DEVELOPMENT IS NOT SALES!

Teams are not pitching their product or technology

Teams are listening to potential customers and other stakeholders and learning about:

- What customers want and need
- Pain points in their customers' daily routines
- Features of a technology that would provide value























I-CORPS CASE STUDY

Novoron : a new drug to restore function after spinal cord injury (SCI)

Before I-CORP

November 2012 - Dr. Travis Stiles' discovery published in Journal of Cell Science

August 2014 - PHASE I NIH grants awarded to develop drugs for SCI and stroke

Novoron at I-CORP

December 2014 - Novoron completes I-CORP at NIH

I-CORPs at NIH Learnings and Pivots

Low interest in early-stage SCI drugs ... but customer segments are interested in Multiple Sclerosis

After I-CORP

December 2015 - Novoron awarded NIH grant to Evaluate New Treatments for Multiple Sclerosis (MS)

- MS work led to increased interest in new indications
- Entered multiple strategic partnerships with focus on negotiation 1 deal

February 2016 - Xconomy recognizes Novoron as San Diego Life Science Startup to Watch in 2016

June 2016 - Patent Issued



Thank you!



Jim Stefansic, PhD MBA Commercialization Consultant

jim.stefansic@gmail.com 615.500.6798

Launch Tennessee

Connect with @LaunchTN | launchtn.org



APPENDIX

APPENDIX A AGENCY REFERENCES/LINKS

SBIR ~\$3.0 Billion

Department of Agriculture - https://nifa.usda.gov/grants Department of Commerce NIST NOAA Department of Defense **DoD SBIR/STTR Resource Center** Air Force Army Chemical and Biological Defense Program (CBD) Defense Advanced Research Projects Agency (DARPA) Defense Logistics Agency (DLA) Defense Microelectronics Activity (DMEA) Defense Technical Information Center (DTIC) Defense Threat Reduction Agency (DTRA) Missile Defense Agency (formerly BMDO) National Geospatial-Intelligence Agency (NGA) (formerly NIMA) Navy **Special Operations Acquisition and Logistics Center** (SOCOM) **Department of Education** ED IES **ED OSERS / NIDDR**

Department of Energy

Department of Health & Human Services (NIH, CDC, FDA, etc.)

Department of Homeland Security <u>DHS S&T Directorate</u> <u>DHS DNDO</u>

Department of Transportation

Environmental Protection Agency

National Aeronautics & Space Administration (NASA)

National Science Foundation

STTR ~\$400 Million

Department of Defense <u>Air Force</u> <u>Army</u> Defense Advanced Research Projects Agency (DARPA) <u>Missile Defense Agency (formerly BMDO)</u> <u>Navy</u>

Department of Energy

Department of Health & Human Services (NIH)

National Aeronautics & Space Administration (NASA)

National Science Foundation



APPENDIX B REGISTRATION INFORMATION

	NASA	HHS	NSF	DOF	DOD
DUNS NUMBER	X	X	X	Х	X
SAM.GOV	X	X	X	X	X
SBIR.GOV [COMPANY REGISTRY]	X	X	X	X	X
GRANTS.GOV		X	X	X	
ERA COMMONS		X			
ELECTRONIC HANDBOOK (EHB)	X				
NSF FASTLANE			Х		
doe portfolio analysis and management system (pams)				X	
FEDCONNECT.NET (FEDERAL GOVERNMENT ACQUISITION AND GRANT PORTAL)				x	
FUNDING ACCOUNTABILITY AND TRANSPARENCY ACT SUB-AWARD REPORTING SYSTEM				x	
DOD SUBMISSION WEBSITE (DODSBIR.GOV)					X

Agency specific registrations and guidance

Department of Health & Human Services (NIH, CDC, FDA) Grants.gov eCommons (NIH online interface)

National Science Foundation FastLane (NSF online interface)

National Aeronautics & Space Administration EHB (Electronic Handbook)

Department of Agriculture Department of Education Grants.gov

Department of Energy

Grants.gov PAMS (DOE Office of Science Portfolio Analysis and Mgmt. System) ASAP (Automated Standard Application for Payments) FedConnect (Federal government acquisition and grant portal)

Department of Defense Dodsbir.net



APPENDIX C ADDITIONAL RESOURCES FOR SUCCESS



NAP – identify other uses of technology, market entry strategy

CAP – technical assistance, strategic alliances, investor partnership facilitation



APPENDIX D ESTABLISH CREDIBILITY BEFORE YOU WRITE

Team Members

- Principal Investigator
- Key Personnel
- Consultants
- Subcontractors
- Accounting

Background Information on Technical Area to be Proposed

Facilities and Equipment

These are where the work will be done (may be multiple locations) and the tools that are available in those facilities to support the work

Project Objectives

- Your technology and how it addresses an important unmet problem
- A statement of your specific novel objectives for the Phase I project
- The results if your project is a success with emphasis on commercialization



APPENDIX E KEY INFORMATION SOURCES ON SBIR/STTR

<u>www.sbir.gov</u> <u>www.zynsys.com/sbir</u> <u>www.sbtc.org</u> <u>www.sbir.us/schedule.html</u> (great schedule by agency chart)

Launch Tennessee SBIR/STTR resources:

http://launchtn.org/entrepreneurship/researchers/microgrants/

